ABSTRACT

A computer is programmed to emulate a fixed-point operation that is normally performed on fixed-point operands, by use of a floating-point operation that is normally performed on floating-point operands. Several embodiments of the just-described computer emulate a fixed-point operation by: expanding at least one fixed-point operand into a floating-point representation (also called "floating-point equivalent"), performing, on the floating-point equivalent, a floating-point operation that corresponds to the fixed-point operation, and reducing a floating-point result into a fixed-point result. The just-described fixed-point result may have the same representation as the fixed-point operand(s) and/or any user-specified fixed-point representation, depending on the embodiment. Also depending on the embodiment, the operands and the result may be either real or complex, and may be either scalar or vector. The above-described emulation may be performed either with an interpreter or with a compiler, depending on the embodiment. A conventional interpreter for an object-oriented language (such as MATLAB version 6) may be extended with a toolbox to perform the emulation. Use of type propagation and operator overloading minimizes the number of changes that a user must make to their program, in order to be able to use such emulation.